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ABSTRACT

In 1982, a study was conducted to compare the effectiveness of the two individualized learning techniques used in the library instruction unit taught at Leeward Community College's library. Specifically, the study sought to determine whether there was a significant difference in the library instruction unit post-test scores of those college freshmen who selected either a self-instructional pamphlet and workbook or an audiotape and workbook. Because only eight students used the audiocued instructional format for all four sections of the unit, while 111 students consistently used the reading instructional format, comparisons were made on the test scores of an unduplicated sample of students for each section of the unit. A t-test for independent samples was used to compare post-test scores. In addition, students' Nelson Denny reading test scores were analyzed to determine differences in the groups, and 17 students who had switched formats were surveyed for their reasons. The study revealed: (1) there was no statistically significant difference between the reading and audiocued groups on either their unit post-test scores or their Nelson Denny reading test scores; and (2) students tended to switch from the audiocued instruction to the reading format because they found the booklet more time-efficient to use or the tapes difficult to understand. The study report cites research comparing audiocued and reading instruction and includes the questionnaire. (AYC)

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A Comparison of the Effectiveness of Two Individualized Study Techniques: Audiocued and Reading

by

Don W. McNeil

Presented To The
Department of Educational Communication and Technology
At The University of Hawaii
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JC 830015

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ABSTRACT

A Comparison of the Effectiveness of Two
Individualized Study Techniques:
Audiocued and Reading

McNeil (1982) did a comparison study of the effectiveness of two individualized learning techniques, audiocued and reading as used in the Library Instruction Unit taught in the Library at the Leeward Community College. The test results of 255 freshmen students were used to perform the comparison. The purpose of the study was to determine if there was a significant difference in the Library Instruction test scores between those college freshmen who select audiocued or reading instruction. By using a posttest-only control group design it was found that there was no significant difference at the 0.05 level of significance. It was concluded that there is no problem with audiocued instruction as currently designed and used for Library Instruction at Leeward Community College.

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A Comparison of the Effectiveness of Two

Individualized Study Techniques:

Audiocued and Reading

Introduction

The coming of each semester at Leeward Community College brings new students into its programs. A working arrangement with the Language Arts Division Freshman English faculty brings over 800 of these students to the Library each semester to be instructed in how to use the library.

The Library requires four sections of self-instruction for those students taking the Library Instruction Unit. The first requirement is for a tour of the library, the second is for instruction in how to use the card catalog, the third is devoted to the use of Library of Congress Subject Headings, and the fourth teaches the use of the periodical and newspaper indexes.

The Library has met the instructional requirements by providing the students with an individualized self-instruction option in either an audiocued or reading format. A student may select either a self-instructional pamphlet and workbook or an audiotape and workbook for self-instruction.

Statement of the Problem

The purpose of this study is to compare the effectiveness of two individualized study techniques, audiocued and reading, with respect to the test scores by college freshmen taking the Library Instruction Unit.

Review of the Literature

The research studies cited are a result of both a manual and a computer search of the literature. Although only one of the studies (Gothberg) was library instruction oriented, there should be no reason to question the applicability of the findings of the other studies to library instruction.

Studies Favoring The A-T Method

Using a general biology course, Meleca (1968) found that the A-T group scored significantly higher. (14)

Quick (1971), in a college biology course, found the A-T group to score significantly higher. (19)

Junkman (1971) studied the effects of a single lesson delivered to students in an Air Force academic instructor course and found the A-T group did significantly better than the group which heard a lecture. (10)

Lyon (1972) studied to determine the effects and results of teaching a freshman science course by a modified course involving A-T wherein the students completed all course requirements at or near a study carrel. It was found that the students did learn the content material at significant levels with respect to all the criteria being considered. (11)

Fields (1973) found A-T produced significantly faster dictation speeds in shorthand classes. (5)

Edwards (1969) studied to determine whether the particular office skill of business machines operation could be as effectively learned from A-T as compared to a traditional classroom situation. A significant difference was found in favor of the experimental treatment. (4)

Tipling (1973), in a college course on the use of audiovisual materials in teaching, found that the A-T group performed significantly higher. (24)

Armstrong (1970) studied to determine if any measurable difference in achievement was gained by an unspecified number of students enrolled in an A-T botany course. The pre-test and posttest examination scores indicated a significant gain in achievement. (1)

Sparks and Unbehaun (1971) reported a comparative study among students enrolled in A-T and conventional biology courses for nonscience majors at Wisconsin State University-LaCrosse. They found the A-T sections performed significantly better. (22)

Stuck (1970) studied to determine if concepts of school law could be effectively taught by A-T to preservice teachers. The experimental group showed a significantly greater increase in achievement than did the traditional group. (23)

Hinds (1971) compared the effectiveness of the conventional and A-T approach for teaching inservice elementary school teachers the principles of simple machines and found significant differences favoring the A-T group. (8)

Studies Favoring The Conventional Method

Russell (1968), who compared A-T and conventional approaches of the teaching of biology at El Centro College in Dallas, Texas, found significant differences favoring conventional instruction. (20)

Studies Finding No Difference Between Treatment Groups

Grobe (1970) compared achievement among students enrolled in A-T and conventional biology courses for nonscience majors at the University of North Dakota. No difference between the groups at the .05 level were found. (7)

McClurg (1971) reported a study comparing conventional and A-T methods among students enrolled in a college geology laboratory at the University of Michigan and found no significant differences between the two groups. (12)

Cornell (1969) studied to determine the success with which the efficiency and the economy of an audio-taped model could be applied to the task of changing the question-asking behavior of experienced, in-service teachers. A comparison of the two group's evaluation scores didn't support the research hypothesis. (2)

Welker (1969) studied A-T and conventional classes in biology at Olney Community College finding no difference in achievement between the treatment groups. (26)

Poham (1961) studied to determine the effectiveness of taped lectures versus live lecture-discussion sessions by teaching an introductory graduate level course by the two methods. Post-tests revealed no significant difference between the two groups. (17)

In a later version of the same experiment, Poham (1962) substituted relatively untrained students as discussion leaders in the taped sessions. Again, results showed no significant differences between the two groups. (18)

Using conventional and A-T groups, Weaver (1969) found no differences in achievement between two general biology groups. (25)

Menne (1969) studied to determine the effectiveness of the taped-lecture method as compared to the lecture method. There were no significant differences between the two groups. (15)

Jenkins (1972) studied to determine the effect that small group interaction might have on student achievement via A-T minicourses. The statistical differences were not significant at the .05 level. (9)

Cunningham (1973) using pretest and posttest for the junior college algebra classes that he compared found no significant differences between the A-T classes using self-paced audiotapes without graphics and conventional instruction. (3)

Gothberg (1976) studied to determine the effects and results of teaching a course in Basic Reference using the audio-tutorial approach. No significant difference was found between students in the two groups. (6)

There were several more studies reviewed that reported no significant differences using the pretest-posttest repeated measures design when comparing the difference between A-T classes and conventional instruction. McVey (1970) compared the results between A-T and conventional teaching of vocational education. (13) Short (1970) studied the difference between the two groups instructing basic nutrition and food science. (21) Using an accounting course, Onah (1971) studied for differences between the two groups. (16)

There were eleven studies favoring the A-T method, one study favoring the conventional method, and fourteen studies finding no difference between the treatment groups. The results of these studies appear to be both inconclusive and contradictory.

Statement of the Hypothesis

The review of the literature indicates that audiocued learning may be neither any better or any worse than the medium of instruction it replaces in achieving results among students. It is hypothesized that there is no significant difference in the Library Instruction test scores between those college freshmen who select audiocued instruction and college freshmen who select instruction by reading.

Method

Subject

The sample group for this study was selected from the approximately 800 students enrolled in the English 100 courses at the Leeward Community College. Most of these students are required to take the four sections of the Library Instruction Unit offered by the Library. Nevertheless, it is recognized that there is a significant student attrition over the testing period with less than half of those who start expected to take all four sections of the library instruction unit.

The original intent was to stratify the students into two groups of fifteen according to whether they used audiocued or reading formated instruction on all four sections of the Unit. These two groups were to form the basis of the study.

When it was ascertained that only eight students used audiocued formated instruction on all four sections of the unit, it was apparent that this was an insufficient number of students upon which to proceed with the study. However, it was decided to select eight students from the one hundred eleven students who used reading formated instruction on all four sections of the Unit and use these two groups as a part of the study.

The subjects of the study proper were structured as follows. It was decided to select thirty students who had used the audiocued format on test 1, a different thirty students on test 2, a different thirty students on test 3, and a different thirty students on test 4. This would provide a total of 120 students representing audiocued instruction.

Students who had used the reading format for their tests would also be selected in groups of thirty with no repetition between the groups. This selection would also result in a total of 120 students.

The students were compared in three combinations. The first combination was composed of the two eight student groups who used the same instructional format on all of their test. The second combination was composed of the eight groups of thirty each, but minus the students in the first combination. The third combination was composed of all ten groups. However, as we will see in the procedure section, it was not possible to obtain all groups with the planned upon number of students.

A possible source of bias could be the selection of the audiocued format by the less skilled readers. This could result in lower test scores due to their reduced reading skill level rather than the use of audiocued instruction.

Instrument

Subjects were tested as they finished each section of the Library Instruction Unit with a locally developed test. There are a number of tests, all different, for each section of the Unit. There are twenty questions of which six are true or false and fourteen are multiple choice on each test. The questions are designed to test the objectives of each section of the Unit. The validity and reliability of the tests are determined by running the completed semesters tests through the GRADECBA computer program developed by the College of Business Administration Computer Laboratory.

In addition, interviews were held with some of the students who switch formats from audiocued to reading and reading to audiocued to ascertain if there was any commonality of reasons among the students. A questionnaire was used to gather information on this topic.

Research Design

The design utilized in this study was the posttest-only control group design (see Figure 1). The posttest only control design was selected because the subject assignment of the subjects to the groups can be construed to be generically random, since administration of a pretest is unnecessary to test the hypothesis. This design controls for all sources of invalidity except mortality. This threat is believed to be of no importance since mortality invalidity will not affect the study.

Figure 1. The Experimental Design

Group	Assignment	N	Treatment	Posttest
1	Self-Assigned	30	Reading	L.S. Test 1
2	Self-Assigned	30	Audiocued	L.S. Test 1
3	Self-Assigned	30	Reading	L.S. Test 2
4	Self-Assigned	30	Audiocued	L.S. Test 2
5	Self-Assigned	30	Reading	L.S. Test 3
6	Self-Assigned	30	Audiocued	L.S. Test 3
7	Self-Assigned	30	Reading	L.S. Test 4
8	Self-Assigned	29	Audiocued	L.S. Test 4
9	Self-Assigned	8	Reading	L.S. Test 1,2,3,4
10	Self-Assigned	8	Audiocued	L.S. Test 1,2,3,4

Procedure

The members of the population used either audiocued or reading formated self-instruction. One hundred and twenty-seven students were selected who used the audiocued format on the tests and one hundred and twenty-eight students were selected who used the reading format on all the tests.

Groups 1, 3, 5, and 7 are four different groups of students using the reading self-instruction. Groups 2, 4, 6, and 8 are four different groups of students using the audiocued self-instruction. Group 9 is composed of the same eight students using the reading self-instruction. Group 10 is composed of the same eight students using the audiocued self-instruction.

To carrying out the study, the circulation charge cards recording the student, section of the unit, and the format of study were collected for one semester, sorted, and counted.

Table 1. Original Sort and Count

Treatment	Test 1		Test 2		Test 3		Test 4	
	No.	%	No.	%	No.	%	No.	%
Reading	571	.736	369	.802	337	.882	308	.893
Audiocued	205	.264	61	.198	45	.118	37	.107
Total	776		460		382		345	

By sorting and matching charge cards, it was ascertained that 111 students took the four sections using the reading format. By further sorting and matching charge cards, it was ascertained that 8 students took the four sections using the audiocued format.

All of these charge cards were removed from the basic file. From the 111 students who took the four sections of the reading format eight students were selected. Thus, there were available two groups of eight cases with one case without a Nelson-Denny score who had taken the four sections of the library unit using one or the other format.

Using the T4 file as the base, the charge cards were sorted and matched so as to remove all duplicated names. The remaining eight files were clean of duplicated names.

Table 2. Final Sort and Count

Treatment	Test 1	Test 2	Test 3	Test 4
Reading	249	158	164	157
Audiocued	145	64	33	29

From the students who used the reading format, the objective was to select thirty unique students for each of the four tests. Similarly, from the students who used the audiocued format, the objective was to select thirty students for each of the four tests, with the exception of the fourth test, where there were but twenty-nine names available.

The students were divided into ten groups and the groups were compared in three combinations. The first combination was composed of the two eight student groups who used the same instructional format on all of their tests. The second combination was composed of seven groups of thirty each and one group of twenty-nine students, but minus the students in the first combination. The third combination was composed of all ten groups.

The 255 cases were coded, keypunched on IBM cards and processed using the Statistical Package for the Social Sciences (SPSS). For the ANOVA computer runs it was necessary to remove 32 case cards for which Nelson-Denny scores were not available.

All other aspects of the study are the same for both groups. Each student comes individually to the library and asks at the reference desk for the workbook for one of the sections. The student then goes to the circulation desk and requests either the audiocued or reading formated section learning guide and proceeds to do the assignment. Upon the completion of the assignment the student returns the learning guide to the circulation desk and comes to the reference desk. There, he or she is asked to leave the workbook while taking the appropriate section test. There are no time limits on any aspect of the self-instruction or on the tests.

Results

Since the overall population is assumed to be normally distributed with variance among the various samples the same, a t test for independent samples was used to compare the audiocued and reading groups on the results of the posttest. (See Tables 5, 6, and 7.)

The Nelson Denny reading scores for all the participating students were analyzed (1) to see if there was any differences between the audiocued and reading groups and (2) to remove this potential source of bias from the t test computation.

Table 3. R^2 Regression Coefficients N = 15

Test	Adjusted for Covariates (Reading)	Proportion of Variation In The Dependent Variable Due To The Effect Of Covariate (Reading)
1	.072	7.2%
2	.046	4.6%
3	.270	27.0%
4	.101	10.1%
Total	.237	23.7%

Table 4. R^2 Regression Coefficients

Test	N	Adjusted for Covariates (Reading)	Proportion of Variation In The Dependent Variable Due To The Effect Of Covariate (Reading)
1	51	.169	16.9%
2	52	.104	10.4%
3	57	.023	2.3%
4	48	.089	8.9%

The Nelson Denny raw score to grade equivalent (See Appendices) is interesting to compare with Tables 5-7. At Leeward Community College a Nelson Denny score of 51 is considered to indicate that a student is capable of operating at the 10.6 grade level. This is further construed to indicate that the student is of college level reading ability and should be scheduled for freshman English. Students scoring under 51 would be led into remedial English courses to prepare them to take English 100. Table 6 indicates that those students were scoring 58.841 on their Nelson Denny tests which translates to a grade equivalent of 12. However, Table 5 indicates that those students were averaging 74.217 on their Nelson Denny tests which translates to a grade equivalent of 13.4. Too, their test scores were approximately 10 points higher on each of the four tests. Though the number of students reported on Table 5 are very small in count, it wouldn't be hard to conjecture that there is a significant relationship between a student's Nelson Denny score and his test scores on the four sections of the Library Unit.

Therefore, an analysis of covariance was performed so that any effect of the reading scores were removed. (See Tables 3 and 4) As the analysis of covariance for two groups is identical to a t-test ($F = t^2$) a separate t-test was not computed. Computation of the t test for independent samples indicated no significant difference at the 0.05 level between the test results of the students using audiocued learning and the students using reading learning. (See Tables 8 and 9) Therefore, the original hypothesis that "there is no significant difference in the Library Instruction test socres between those college freshmen who select instruction by reading" was supported.

Table 5. First Comparison. The Audiocued And Reading Groups On The Results Of The Posttest.

Method	Nelson Denny		
	N	$\bar{X}$	SD
Audiocued	7	71.429	15.841
Reading	8	76.750	27.463
Total	15	74.267	22.186

Test 1			Test 2			Test 3			Test 4		
N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
8	90.625	8.210	8	85.000	9.258	8	83.750	10.607	8	84.375	13.212
8	86.875	10.329	8	88.125	7.990	8	93.750	4.432	7	86.429	8.997
16	88.750	9.220	16	86.563	8.509	16	88.750	9.399	15	85.333	11.095

Table 6. Second Comparison. The Audiocued And Reading Score Groups On The Results Of The Posttest.

Method	Nelson Denny		
	N	$\bar{X}$	SD
Audiocued	111	58.459	19.944
Reading	97	59.278	22.256
Total	208	58.841	21.006

Test 1			Test 2			Test 3			Test 4		
N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
30	80.167	15.508	30	78.833	17.552	30	75.833	15.485	29	75.690	19.026
30	77.833	18.415	30	77.000	19.791	30	77.333	19.375	30	71.500	23.750
60	79.000	21.006	60	77.917	14.121	60	76.583	17.406	59	73.559	21.477

Table 7. Third Comparison. The Audiocued And Reading Score Groups Of The Results Of The Posttest

Method	Nelson Denny		
	N	$\bar{X}$	SD
Audiocued	118	59.229	19.908
Reading	105	60.610	23.015
Total	223	59.874	21.389

Test 1			Test 2			Test 3			Test 4		
N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
38	82.368	14.830	38	80.132	16.253	38	77.500	14.830	37	77.568	18.128
38	79.737	17.318	38	79.342	10.409	38	80.789	18.546	37	74.324	22.428
76	81.053	16.069	76	79.737	13.562	76	79.145	16.761	74	75.946	20.317

Table 8. Analysis of Covariance of Library Skills Test for Leeward Community College Students Taught By Audiocued Or Reading Method With Nelson Denny Reading Scores As Covariate

N = 15

Tests	Source of Variation	SS	DF	MS	F	Significance Of F $\alpha \geq .05$
Test 1	Covariate	6.04	1	6.039	0.062	NS
	Main Effect of Method	84.15	1	84.151	0.863	NS
	Explained Variation	90.19	2	45.095	0.463	
	Residual (Error)	1169.81	12	97.484		
	Total Variation	1259.99	14	90.000		
Test 2	Covariate	34.74	1	34.748	0.551	NS
	Main Effect of Method	1.38	1	1.384	0.022	NS
	Explained Variation	36.13	2	18.066	0.286	NS
	Residual (Error)	757.20	12	63.100		
	Total Variation	793.33	14	56.667		
Test 3	Covariate	10.01	1	10.012	0.132	NS
	Main Effect of Method	325.21	1	325.213	4.297	NS
	Explained Variation	335.23	2	167.613	2.215	NS
	Residual (Error)	908.10	12	75.676		
	Total Variation	1243.33	14	88.809		
Test 4	Covariate	110.97	1	110.965	1.061	NS
	Main Effect of Method	18.73	1	18.730	0.179	NS
	Explained Variation	129.69	2	64.848	0.620	NS
	Residual (Error)	1150.66	11	104.605		
	Total Variation	1280.35	13	98.489		
All Lists Combined	Covariate	3346.30	1	3346.30	3.385	NS
	Main Effect of Method	330.28	1	330.28	0.334	NS
	Explained Variation	3676.58	2	1838.29	1.859	NS
	Residual (Error)	11863.40	12	988.61		
	Total Variation	15539.99	14	1109.99		

Table 9. Analysis of Covariance Of Library Skills Test For Leeward Community College Students Taught By Audiocued Or Reading Method With Nelson Denny Reading Scores As Covariate

Tests	Source of Variation	SS	DF	MS	F	Significance Of F $\alpha \geq .05$
Test 1	Covariate	1884.645	1	1884.645	9.495	NS
N = 51	Main Effect of Method	50.868	1	50.868	0.256	NS
	Explained Variation	1935.516	2	967.758	4.876	NS
	Residual (Error)	9527.164	48	198.483		
	Total Variation	11462.680	50	229.254		
Test 2	Covariate	1131.546	1	1131.546	5.445	NS
N = 52	Main Effect of Method	55.571	1	55.571	0.267	NS
	Explained Variation	1187.121	2	593.561	2.856	NS
	Residual (Error)	10183.512	49	207.827		
	Total Variation	11370.633	51	222.954		
Test 3	Covariate	314.512	1	314.512	0.992	NS
N = 57	Main Effect of Method	80.847	1	80.847	0.255	NS
	Explained Variation	395.359	2	197.680	0.623	NS
	Residual (Error)	17121.199	54	317.059		
	Total Variation	17516.559	56	312.796		
Test 4	Covariate	718.834	1	718.834	1.822	NS
N = 48	Main Effect of Method	311.823	1	311.823	0.790	NS
	Explained Variation	1030.660	2	515.330	1.306	NS
	Residual (Error)	17752.082	45	394.490		
	Total Variation	18782.742	47	399.633		

Conclusions and Recommendations

It was concluded, based upon the results, that there is no significant difference in this situation between the use of audiocued and reading learning.

Seventeen questionnaires from students who had completed some of the sections using the audiocued mode and switched to the reading mode brought forth the following comments. (See Appendices for example of questionnaire.)

1. I switched from tapes to pamphlets because I could go back and find information faster than on the tape.
2. The content of the tape was extremely boring.
3. The pamphlet is easier to refer to, whereas the tape needed to be rewound.
4. It was easier to listen to the tape while walking (Section I, Tour) but the following sections more or less kept one stationary.
5. I switched from the tape to the pamphlets so that I could go faster.
6. The tape was too slow, so I switched to the pamphlets.
7. The headphones were too tight. (There were two such responses.)
8. I needed a visual assistance that the tape couldn't provide.
9. I wanted to try the pamphlet. It was better.
10. I didn't pass the second test so I tried the pamphlet. It was clearer than the tape.
11. The tape is too slow. I had to run the tape two or three times to get the instructions.

12. I would rather read it.
13. I switched from tape to pamphlet because I answered the questions (in the workbook) and didn't know the answer I had to rewind the tape back to where I could find the answer which takes time, whereas using the pamphlet is faster. You can refer to the pages faster and find your answer.
14. The tape was slow moving and I got kind of tired listening to it.
15. I didn't understand it too well on tape.
16. I find that by using the pamphlet method it was more understandable to comprehend.

A principle reason for switching from the tape to reading is the assessment that the amount of time it takes to use the audiocued mode as compared to the reading mode is the noneconomical use of the students time. Other reasons for switching were that the tape was not as understandable, that the tape was not clear, and that the earphones became uncomfortable. Thus, it appears that students choosing the tape as first choice may turn to the pamphlet for personal reasons that do not reflect upon the quality of the tapes content.

Thus, not only was the original hypothesis supported, but there is no problem with the audiocued modes subject content.

Summary

The purpose of this study was to determine if there is a significant difference in the Library Instruction test scores between those college freshmen who select audiocued or reading instruction. By using a posttest-only control group design it was found that there was no significant difference at the 0.05 level of significance. It was concluded that there is no problem with the audiocued instruction as currently designed and used for Library Instruction at Leeward Community College Library.

References

1. Armstrong, John Hallsten, "An Exploratory Study of the Effectiveness of an Instrument of Instruction in an Introductory Botany Course at Oklahoma State University," D.A.I., v. 31, n. 11, (1971), p. 5785-A.

2. Cornell, Evart Frantz, "Observational Learning of Question-Asking Behavior Through The Medium of Audio-Tapes," D.A.I., v. 3, n. 3, (1970), p. 1112-A.

3. Cunningham, W.D., "An Evaluation of an Audio-Tutorial Algebra Course at the Junior College Level," D.A.I., v. 33, (1973), pp. 5431-A - 5432-A.

4. Edwards, Ronald Kenneth, "An Experimental Study in the Teaching of Business Machines Utilizing an Audio-Visual-Tutorial Laboratory Approach with Continuous-Loop Sound Films," D.A.I., v. 31, (1970), p. 1135-A.

5. Fields, J.D., "Development and Evaluation of An Audio-Tutorial Laboratory for Building Shorthand Dictation Speed," D.A.I., v. 34, (1973), p. 3019-A.

6. Gothberg, Helen M., "A Comparison of Two Teaching Methodologies for a Course in Basic Reference. Final Report," ED 167 097, ERIC, (1976).

7. Grobe, C.H., "Comparisons in College Biology Achievement Between the Audio-Tutorial and Conventional Methods of Instruction for Non-Science Majors," D.A.I., v. 32, (1972), p. 6824-A.

8. Hinds, C.C., "An Audio-Tutorial Independent Study Program for the Elementary Teacher," D.A.I., v. 32, (1971), p. 3114-A.

9. Jenkins, J.R., "A Study of Small Group vs. Individual Achievement via the Audio-Tutorial Instructional System," D.A.I., v. 33, (1972), pp. 5616-A - 5617-A.

10. Junkmann, L.G., "An Investigation and Comparison of Accelerated Audio-Visual Instruction vs. Lecture Presentations in the United States Air Force Academic Instructor Course," D.A.I., v. 32, (1972), p. 4243-A.

11. Lyon, Edward Ellisworth, "The Teaching of a College Level Physical Geography-Earth Science Course by an Audio-Visual-Tutorial Independent Study Method: An Evaluation," D.A.I., v. 33, (1972), p. 1591-A.

12. McClurg, J.E., "The Development and Experimental Evaluation of an Open-Scheduled Auto-Tutorial Geology Laboratory," D.A.I., v. 34, (1973), pp. 1729-A - 1730-A.

13. McVey, G.C., "An Experimental Evaluation of the Effectiveness of an Audio-Tutorial Method in Teaching Vocational Agriculture," D.A.I., v. 31, (1970), p. 4645-A.

14. Meleca, C.B., "An Analysis of the Relationship of Student Abilities to Level of Achievement in an Auto-Instructional Program," D.A.I., v. 29, (1968), pp. 4384-A - 4385-A.

15. Menne, J.W., J.E. Klingensmth, and D.L. Nord, "The Feasibility of Using Taped Lectures to Replace Class Attendance," American Educational Research Association, Los Angeles, 1969.

16. Onah, J.O., "An Experimental Study Using the Audio-Visual-Tutorial System to Teach Principles of Accounting I to Community College Students," D.A.I., v. 32, (1971), p. 2841-A.

17. Poham, W.J., "Tape Recorded Lectures in the College Classroom," Educational Communications and Technology: A Journal of Theory, Research, and Development, 1961, pp. 109-118.

18. Poham, W.J., "Tape Recorded Lectures in the College Classroom -- II," Educational Communications and Technology: A Journal of Theory, Research, and Development, 1962, pp. 94-101.

19. Quick, C.L., "An Analysis and Evaluation of an Audio-Tutorial Approach in the Biology Laboratory at the University Community and Technical College, the University of Toledo," D.A.I., v. 32, (1972), p. 3871-A.

20. Russell, William Bruce, "Some Comparisons of the Audio-Tutorial Method with the Conventional Method in Introductory College Biology," D.A.I., v. 29, (1969), p. 3535-A.

21. Short, S.H., "The Development and Comparative Evaluation of a Course in Basic Nutrition and Food Science Taught by Self-Instruction Methods," D.A.I., v. 3, (1971), pp. 5803-A - 5804-A.

22. Sparks, P.D., and L.M. Unbehaun, "Achievement of Audio-Tutorial and Conventional Biology Students: A Comparative Study," BioScience, v. 21, (1971), pp. 574 - 576.

23. Stuck, D.L. and R.P. Manatt, "A Comparison of Audio-Tutorial and Lecture Methods of Teaching," The Journal of Educational Research, v. 63, (1970), pp. 414 - 418.

24. Tipling, R.N., "An Evaluation of the Effects of a Student Guide and Automated Course in Comparison to a Traditional Approach in the teaching the course 'Audiovisual Methods in Teaching'," D.A.I., v. 34, (1973), pp. 2939-A - 2940-A.

25. Weaver, G.M., "An Evaluation and Analysis of Audio-Tutorial Instruction in a General Education Biology Course", D.A.I., v. 30, (1969), pp. 5268-A - 5259-A.

26. Welker, J.D., "Selected Factors and Achievement in an Audio-Tutorial Introductory College Biology Course," D.A.I., v. 31, (1970), p. 249-A.

Appendices

Appendix A

NELSON DENNY
RAW SCORE TO GRADE EQUIVALENT
FORM D

Raw Score	Vocabulary G.E.	Comprehension G.E.	Total G.E.
95			15.0*
94			14.9*
93			14.9*
92			14.8*
91			14.7*
90			14.6*
89			14.5*
88			14.4*
87			14.3*
86			14.2*
85			14.2*
84			14.1*
83			14.1*
82			14.0*
81			14.0*
80			13.9*
79			13.9*
78			13.8*
77			13.7*
76			13.6*
75			13.6*
74			13.5*
73			13.4*
72			13.3*
71			13.2*
70			13.1*
69			13.0*
68			13.0*
67			12.9*
66			12.8*
65			12.7*
64			12.6*
63			12.5*
62			12.4*
61			12.3
60			12.1
59			12.0
58			11.9
57			11.8
56			11.6
55			11.4
54			11.2
53			10.9
52		15.0*	10.7
51		-	10.6
50		14.7*	10.5
49		-	10.3
48		14.4*	10.2
47		-	10.0

*Extrapolated

Raw Score	Vocabulary G.E.	Comprehension G.E.	Total G.E.
46		14.0*	9.8
45		-	9.7
44	15.0*	13.7*	9.5
43	14.9*	-	9.3
42	14.8*	13.4*	9.1
41	14.7*	-	9.0*
40	14.7*	13.1*	8.9*
39	14.6*	-	8.7*
38	14.5*	12.6*	8.5*
37	14.4*	-	8.3*
36	14.3*	11.9	8.1*
35	14.2*	-	8.0*
34	14.0*	11.2	7.8*
33	13.9*	-	7.7*
32	13.8*	10.6	7.5*
31	13.6*	-	7.3*
30	13.5*	9.9	7.1*
29	13.3*	-	6.9*
28	13.1*	9.2	6.8*
27	12.9*	-	6.6*
26	12.7*	8.7*	6.4*
25	12.5*	-	6.2*
24	12.2	8.1	6.0*
23	11.9	-	
22	11.6	7.5*	
21	11.3	-	
20	11.0	7.0*	
19	10.7	-	
18	10.4	6.6*	
17	10.1	-	
16	9.6	6.3*	
15	9.3	-	
14	9.0*	6.0*	
13	8.7*		
12	8.3*		
11	8.0*		
10	7.8*		
9	7.6*		
8	7.4*		
7	7.2*		
6	7.1*		
5	7.0*		
4	6.8*		
3	6.6*		
2	6.4*		
1	6.2*		
0	6.1*		

*Extrapolated

Appendix B

LIBRARY UNIT EVALUATION

To help the library staff with the continuous revision of this instructional unit, please complete this questionnaire by placing a check mark in the appropriate boxes and leaving this sheet in the red box on the mauka end of the Circulation Desk.

After completing this instructional unit, I feel:	to a large degree	to some degree	to a small degree	not at all	no opinion
1. more comfortable and competent in using the library.					
2. the experience will save me time and effort in the future.					
3. the workbook exercises are useful.					
4. the pamphlets provide adequate instruction.					
5. the tapes provide adequate instruction.					
6. the tests are fair.					
7. my knowledge about how to use a library has increased.					
8. my ability to handle class assignments has improved.					
9. I understand why my professor assigned the unit.					
10. the unit presents information which was new to me.					

Total amount of time it took to complete the entire library instruction program, Section 1 through Section 4: _____ hours.

I used the:	Tape	Pamphlet	Both
for Section One			
for Section Two			
for Section Three			
for Section Four			

If you switched from tape to pamphlet or vice versa, please tell us why you made the switch. _____

COMMENTS: *On the back of this paper, please make any comments you wish -- including suggestions concerning any area which you feel needs improvement or clarification.*

Name _____
(optional)

Appendix C

```
FILE NAME          CETISTAR
VARIABLE LIST      METHOD, READING, TEST1, TEST2, TEST3, TEST4
N OF CASES         UNKNOWN
INPUT MEDIUM       CARD
INPUT FORMAT       FIXED (5X,1F1.0,5F4.0)
VAR LABELS         READING,READING SCORES ON NELSON-DENNY/
                   TEST1,TEST ONE/
                   TEST2,TEST TWO/
                   TEST3,TEST THREE/
                   TEST4,TEST FOUR
VALUE LABELS       METHOD (1) AUDIOCUED METHOD (2) READING METHOD
MISSING VALUES     READING TO TEST4 (000)
LIST CASES         CASES=255/VARIABLES=ALL
FREQUENCIES        GENERAL=ALL
STATISTICS         ALL
OPTIONS            8
READ INPUT DATA
  1  2  51  95
  2  2  47  70
  3  2  57  45
  4  2  80 100
  5  2  56  90
  6  2  76  65
  7  2     100
  8  2      15
  9  2  54  85
 10  2  69  60
 11  2  62  80
 12  2  48  75
 13  2  40  80
 14  2  50  65
 15  2     100
 16  2  59  70
 17  2  29  80
 18  2  51  90
 19  2  64  95
 20  2      70
 21  2      85
 22  2 108 100
 23  2  98  95
 24  2  52  60
 25  2      85
 26  2      90
 27  2  35  70
 28  2  72  80
 29  2      70
 30  2      70
 31  2  43      80
 32  2 130      85
 33  2  64      95
 34  2          85
 35  2          80
 36  2  58      90
 37  2  26      85
 38  2          80
 39  2  50      55
 40  2  83      85
 41  2  47      75
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47	2	45	75			
48	2	68	80			
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50	2	74	65			
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52	2	64	75			
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94	2				55	
95	2	31			55	
96	2	34			55	
97	2	81			75	
98	2	103			90	
99	2				100	

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102	2	53				45
103	2	36				80
104	2	57				80
105	2					80
106	2	57				40
107	2	46				35
108	2	79				75
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111	2	134				95
112	2					100
113	2	43				90
114	2	40				50
115	2	61				85
116	2	31				90
117	2	46				85
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119	2					45
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121	2	90	90	100	100	100
122	2	69	100	85	100	85
123	2	48	85	85	90	75
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167	1	47		75
168	1	76		90
169	1	69		60
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171	1	49		90
172	1			85
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179	1	53		60
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209	1	60	80	
210	1	43	45	
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212	1	48	85	
213	1	54	80	
214	1	72	95	
215	1	45	70	

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216  1          70
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219  1                  90
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225  1  74              90
226  1                  80
227  1                  65
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230  1                  75
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237  1 102              70
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239  1  46              80
240  1  77               5
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244  1  86              70
245  1  60              70
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252  1  90  95  90  90  85
253  1  49  90  80  90 100
254  1  92 100  80  75  80
255  1  77  90  90  95  95
256  1      85  70  80  65
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STATISTICS      ALL
OPTIONS         8
*SELECT IF      (METHOD=2)
FREQUENCIES     GENERAL=ALL
STATISTICS      ALL
OPTIONS         8
ANOVA           TEST1 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST2 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST3 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST4 BY METHOD (1,2) WITH READING
STATISTICS      ALL
```

Appendix D

```
FILE NAME        CETISTAR
VARIABLE LIST    METHOD, READING, TEST1, TEST2, TEST3, TEST4
N OF CASES       UNKNOWN
INPUT MEDIUM     CARD
INPUT FORMAT     FIXED (5X,1F1.0,5F4.0)
VAR LABELS       READING,READING SCORES ON NELSON-DENNY/
                 TEST1,TEST ONE/
                 TEST2,TEST TWO/
                 TEST3,TEST THREE/
                 TEST4,TEST FOUR
VALUE LABELS     METHOD (1) AUDIOCUED METHOD (2) READING METHOD
MISSING VALUES   READING TO TEST4 (000)
LIST CASES       CASES=239/VARIABLES=ALL
FREQUENCIES      GENERAL=ALL
STATISTICS       ALL
OPTIONS          8
READ INPUT DATA
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  6   2  76  65
  7   2     100
  8   2      15
  9   2  54  85
 10   2  69  60
 11   2  62  80
 12   2  48  75
 13   2  40  80
 14   2  50  65
 15   2     100
 16   2  59  70
 17   2  29  80
 18   2  51  90
 19   2  64  95
 20   2      70
 21   2      85
 22   2 108 100
 23   2  98  95
 24   2  52  60
 25   2      85
 26   2      90
 27   2  35  70
 28   2  72  80
 29   2      70
 30   2      70
 31   2  43      80
 32   2 130      85
 33   2  64      95
 34   2          85
 35   2          80
 36   2  58      90
 37   2  26      85
 38   2          80
 39   2  50      55
 40   2  83      85
 41   2  47      75
```

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97	2	81			75
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99	2				100

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165	1	86		55	

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168	1	76			90
169	1	69			60
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171	1	49			90
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218	1	26	30		
219	1			90	
220	1	36		90	
221	1	46		60	
222	1	82		65	
223	1	58		95	

```
224   1   43                  95
225   1   74                  90
226   1                       80
227   1                       65
228   1   85                  95
229   1   61                  80
230   1                       75
231   1   50                  85
232   1                       55
233   1   35                  95
234   1   53                  70
235   1   60                  95
236   1   34                  90
237   1  102                  70
238   1   81                  95
239   1   46                  80
240   1   77                   5
241   1   30                  70
242   1   39                  55
243   1   64                  85
244   1   86                  70
245   1   60                  70
246   1   45                  60
247   1   54                  65
END INPUT DATA
*SELECT IF      (METHOD=1)
FREQUENCES      GENERAL=ALL
STATISTICS      ALL
OPTIONS         8
*SELECT IF      (METHOD=2)
FREQUENCIES     GENERAL=ALL
STATISTICS      ALL
OPTIONS         8
ANOVA           TEST1 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST2 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST3 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST4 BY METHOD (1,2) WITH READING
STATISTICS      ALL
```

Appendix E

```
FILE NAME       CETISTAR
VARIABLE LIST   METHOD, READING, TEST1, TEST2, TEST3, TEST4
N OF CASES      UNKNOWN
INPUT MEDIUM    CARD
INPUT FORMAT    FIXED (5X,1F1.0,5F4.0)
VAR LABELS      READING,READING SCORES ON NELSON-DENNY/
                TEST1,TEST ONE/
                TEST2,TEST TWO/
                TEST3,TEST THREE/
                TEST4,TEST FOUR
VALUE LABELS    METHOD (1) AUDIOCUED METHOD (2) READING METHOD
MISSING VALUES  READING TO TEST4 (000)
FREQUENCIES     GENERAL=ALL
STATISTICS      ALL
OPTIONS         8
READ INPUT DATA
121  2  90  90 100 100 100
122  2  69 100  85 100  85
123  2  48  85  85  90  75
124  2 106  80  80  95  90
125  2  95  70  80  90  90
126  2  56  80  90  90  75
127  2  39  90  85  95
128  2 111 100 100  90  90
249  1  67 100 100  95 100
250  1  59  90  80  65  70
251  1  66  75  90  80  80
252  1  90  95  90  90  85
253  1  49  90  80  90 100
254  1  92 100  80  75  80
255  1  77  90  90  95  95
256  1      85  70  80  65
END INPUT DATA
*SELECT IF      (METHOD=1)
FREQUENCES      GENERAL=ALL
STATISTICS      ALL
OPTIONS         8
*SELECT IF      (METHOD=2)
FREQUENCIES     GENERAL=ALL
STATISTICS      ALL
OPTIONS         8
*COMPUTE        SUMTESTS = TEST1 + TEST2 + TEST3 + TEST4
LIST CASES      CASES=16/VARIABLES=ALL
ANOVA           TEST1 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST2 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST3 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           TEST4 BY METHOD (1,2) WITH READING
STATISTICS      ALL
ANOVA           SUMTESTS BY METHOD (1,2) WITH READING
STATISTICS      ALL
```

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